QK
495
H3H38
Botany

NEWSLETTER

of the

Hawaiian Botanical Society

Volume V, Number 1 February 1966

The HAWAIIAN BOTANICAL SOCIETY is published in February, April, June, October, and December. It is distributed to all Society members with the purpose of informing them about the botanical news and progress in Hawaii and the Pacific. News contributions and articles are welcomed. The deadline for submission of news items is the 12th of each month prior to publication. Printed at the Experiment Station of the Hawaiian Sugar Planters' Association. Membership dues are $3.00 and include receipt of Newsletter.

ENZYME FINGERPRINTS FOR THE PLANT DETECTIVE[1]

James L. Brewbaker [2]

To Sherlock Holmes, the color and texture of a visitor's cigar ash or of the dust on his shoes, were signs which often distinguished men as surely as their more obvious physiognomic features. Similarly, the plant systematist uses many traits that are obvious only to what Charles Darwin has called the "practiced eye." [3] The modern biochemist carries such distinctions much further, however, by adding unseen traits to the arsenal of the systematist. Many efforts have been made to uncover biochemical or physiological differences that distinguish two varieties or species of plants easily and qualitatively. Research conducted in our laboratory[4] and others encourages the view that the multiple molecular forms of enzymes (known as isozymes) represent an extremely promising tool for this type of plant detection. Of particular interest is the fact that two species or varieties can often be distinguished by isozymes in tissues as diverse as roots, seeds and even pollen grains.

Enzymes are proteins, usually large molecules, with an electric charge which varies depending on the acidity of their surroundings. Due to this charge, they will migrate when placed in an electromagnetic field. The catalases of plants, for example, are large molecules which act as if they were negatively charged when placed in alkaline media. As a result of this negative charge, they move towards a positive pole in an electric field. In the past decade, it was observed that a gelatinous medium made out of highly purified starch provided an excellent base for separating proteins in an electromagnetic field (a process known as gel electrophoresis).

When corn seeds from the varieties "Hawaiian Sugar" and "Golden Cross Bantam" are ground up, and the extracts subjected to electrophoresis, the two extracts can be easily

---

1 Part of the Presidential Address presented at the December 1965 meeting of the Hawaiian Botanical Society.

2 Professor of Horticulture, University of Hawaii.

3 From "Animals and Plant Under Domestication," Vol. I., p. 361.

4 Special acknowledgement is made of the cooperation of Assistant Professors M. Upadhya, Y. Iwanami and Y. Makinen, and Assistants T. Macdonald, L. Espiritu, K. Ching and B. Hamill, Department of Horticulture, University of Hawaii.

SHOUT
SHARE
IT

dis inguished by their different catalase molecules. "Hawaiian Sugar" has a single fast moving catalase, "Golden Cross" a slow moving catalase, indicating constant differences in the charge or size of catalase molecules of the two varieties. Genetic studies reveal that each isozyme is synthesized under control of a single gene (in this case, alleles of a single locus). Similar differences have been observed for every enzyme system susceptible to this type of study.

Six enzyme systems have been used extensively in our studies. The approximate number of distinctly separated isozymes observed in corn for each system are as follows: 17 esterases, six leucineaminopeptidases, three amylases, five perosidases, three alkaline phosphatases, and three catalases. Electrophoretic variations for these systems have been studied in many other species, including orchids, koa haole, mangoes, and pineapple. Some results are summarized below with respect to species differences, varietal differences, and tissue differences.

Isozyme differences at the species level. Many studies suggest that isoenzymes could be used to distinguish almost any two related plant species. Isoenzyme variations among species of the genus Leucaena (koa haole), for example, confirmed other evidence for the probable identity of two species (L. leucocephala and L. esculenta), and for the clear distinction between two other species of very similar morphology but different base chromosome number (L. pulverulenta and L. "buitenzorg"). Esterases and amylases from seeds and roots proved most valuable for these studies. The esterases of Cassia leaves confirmed the probable hybrid origin of the "rainbow shower" from the species C. fistula and C. javanica, while esterases and aminopeptidases from pollinia appeared to distinguish most orchid species tested.

Isozyme variations within species are common, and must be considered in making distinctions between species. However, certain isozymes show no variation within species, suggesting their origin either from complex multigenic systems, or from systems in which mutations produce isozymes which are ineffective or detrimental.

Isozyme differences at the varietal level. Among our early discoveries was the interesting fact that pollen of a Cayenne pineapple were enzymatically distinguishable from pollen of other varieties bred by the Pineapple Research Institute of Hawaii. Distinguishing two varieties of plants by their pollen grains seems to be a sort of ultimate in use of the isozyme technique!

Studies of 15 mango varieties revealed that all could be distinguished by esterases and aminopeptidases of their fruits; preliminary studies indicated that leaf extracts could also be used to identify seedling trees. Distinguishing differences have also been seen among clonal varieties of sugar cane and citrus.

Varieties of self-pollinated plants are customarily very uniform, reflecting a high degree of genetic homozygosity. In contrast, varieties of cross-pollinated plants are much more heterogenous. Isoenzyme differences are often under the control of alleles at a single gene locus; such differences are absent in clonal varieties and rare in self-pollinated varieties, but are more frequent in varieties of cross-pollinated plants. This has been illustrated by the rarity of isozymic differences within varieties of koa haole (self-pollinated), but its rather common occurrence in corn varieties.

Isozyme differences among tissues. All tissues are distinguished by quantitative or qualitative enzymatic differences, reflecting differences in site, time and intensity of gene action. With reference to plant systematics, therefore, judicious choice must be made of tissues for comparative studies. Rapidly growing, healthy tissues have been superior for many isozymic studies, while storage tissues like bulbs, seeds and pollen are excellent for others. Isozyme differences have been noted between embryo and endosperm, between plumules and roots of seedlings, between pollen and anther wall, and between stigmas and styles--all of potential interest to morphologists.

Among the more interesting of tissue differences observed in our studies are those distinguishing immature from ripe fruits. Most fruits undergo a climacteric change, unnoticeable superficially, at which time ethylene evolution is often maximized. At this time, fruits like the mango and papaya undergo striking changes in isozyme patterns, which

may thus be used to distinguish the stage of ripeness of the fruits.

Summarizing, there is increasing evidence from these and other research programs to enforce the view that electrophoretic variations of enzymes (known as isozymes) may become very important "fingerprints" for the plant detective and systematist.

KAUAI NATIONAL PARK, HAWAII - A PROPOSAL[1]

In 1961 a resolution was passed by the Tenth Pacific Science Congress stating that the area on the island of Kauai, known as Kokee and Alakai Swamp, should be made a national park. Previous to this, there had been many proposals that the region should come under the jurisdiction of the National Park Service. Most of it was once supervised by the Territorial Division of Forestry; more recently it became a part of the Division of State Parks. Its former Head Ranger, Joe Souza, is now Director of that Division. An earlier issue of the Newsletter[2] described many of the parks' features.

The NPS began a survey of the region in 1962, with a contract made with the Honolulu office of Harland Bartholomew and Associates (now Donald Wolbrink & Associates, Inc.). Several local scientists, including William K. Kikuchi (archeologist) and Alvin K. Chock (botanist), contributed to the program. Cooperation in the studies was made by the State Department of Land and Natural Resources, in particular the Division of State Parks and Division of Water and Land Development, and by a number of local residents.

The proposal of the NPS includes "spectacular wilderness coastline; mysterious swamp lands perched surprisingly on Kauai's 'roof' in almost perpetual rainfall; two coral sand beaches, one palm-fringed and one backed by verdant waterfall-laced cliffs, and the other below parched and barren lava headlands; deep valleys eroded through hundreds of colorful island-forming lava flows; countless remnants of ancient Hawaiian civilization; varied recreational opportunities--many already recognized by Hawaii's State Park System; and to realize the diverse potential of this complex resource, to protect the scenic and scientific features which make this area unique, a National Park of approximately 97,000 acres is proposed."

The park objectives are threefold. (1) "To conserve and manage for their highest purpose the natural, historical, and recreation resources in this outstanding park complex." Management programs would be established to emphasize conservation and recreation appropriate to these uses in the areas. A land use plan would insure a balanced relationship between preservation and special recreation needs. Means of reduction and eradication would be developed for exotic plants and feral animals which are damaging the natural resources of the area. (2) "To provide for the highest quality of use and enjoyment of the proposed Kauai National Park by increasing numbers of visitors in years to come." The primary objective is to enable visitors to enjoy the natural beauty and to appreciate the historical features of the area in conjunction with its recreational opportunities. Development would be made compatible with the primary park features, and certain areas would be preserved as roadless wilderness. (3) "To communicate the natural, cultural, inspirational, and recreational significance of the proposed park in line with established programs throughout the National Park System." An interpretive program would be provided to give visitor information, local community relations would be strengthened through communication of park policies and purposes, and temporary and career employment would be provided for residents who are interested in the NPS program.

---

[1] In part abstracted from a 34-page publication with the same title which was prepared by the National Park Service, U. S. Department of Interior, 1965. Copies may be obtained from the Regional Director, National Park Service, 450 Golden Gate Avenue, Box 36063, San Francisco, California 94102.

[2] Chock, Alvin K. 1963. Kokee. Hawaiian Botanical Society Newsletter II(3):37-39.

SMITH... INSTI... FEB 16 1966

The proposed park area would cover Mt. Waialeale, the Na Pali Coast, Lumahai Beach, Barking Sands beach, Waimea Canyon, Alakai Swamp, Olokele Canyon, Lumahai Valley, and Wainiha Valley. This area would include all major geologic events of Kauai such as the creation of an ancestral shield volcano, the summit collapse to form a great caldera, erosion of the Kauai dome, high sea cliffs, deep canyons, and deposition of shoreline sediments. The area is rich in plant species, many of which are endemic to that region. Many of Hawaii's native birds still persist in that wilderness. A number of historical and archaeological sites are also located in the proposed park.

The present water rights, such as Wainiha Valley's power plant, would continue to exist. Control of the introduced goats and pigs would be by the NPS ("As is the case now in Waimea Canyon and Kokee State Parks, public hunting of feral or native animals would not be allowed in the proposed National Park."). There would be no change in the present regulations on fishing since "sport fishing has historically been accepted as a desirable activity in National Parks throughout the Mainland." Fruit and berry picking would continue "with controls similar to those now imposed by the State." The military and space installations at Kokee "would remain under suitable arrangements between the National Park Service and the Department of Defense." Limited grazing occurs in several areas, and "it is anticipated that this operation should eventually be phased out." Since taro was the most important staple crop in Hawaii, its cultivation would be continued and even encouraged. The continuation of the use of mountain cabins would be permitted "until such time as it can be phased out."

Approximately 65,000 acres of the proposed area is now under State ownership (Division of Forestry, Division of State Parks, and Hawaiian Homes Commission), and the remainder under private ownership.

Comments or suggestions on this proposal are solicited by National Park Service, and they should be forwarded to the Regional Director, National Park Service, in San Francisco.

(Alvin K. Chock)

BOOK REVIEW

CARLQUIST, SHERWIN. 1965. Island Life, A Natural History of the World. 451 pp. New York: The Natural History Press ($9.95).

This volume will be of interest to all members of the Hawaiian Botanical Society. The author, a Society member and well-known for his publications in plant anatomy, has produced a collation of data which is a lineal descendant of Wallace's Island Life published in 1880. This new Island Life represents the only modern gathering of popular information on the evolution of insular biotas.

The book is divided into sixteen chapters. The first are of a somewhat general nature and describe the unique features of various island groups and their environments. It is made evident that the "high" islands and their biota will be the subject of concentration. Chapter-length explanations of some basic evolutionary mechanisms are written in easily understood language and illustrated by fascinating examples. These are followed by chapters wholly devoted to specialized groups of insular organisms. The author is particularly lucid when speaking of the evolutionary diversity found in island-dwelling genera of the Compositae.

The information presented will stimulate interest in the life found on islands for several reasons. First, many statements are made with a narrow factual background. This serves to point up to the paucity of information. Second, many statements based on some factual material are highly speculative. These serve to point up the difficulties of an undertaking which attempts to cover the islands of the world. For example, the subject of lava flows

as isolating mechanisms is mentioned, but little factual knowledge can be cited to support the relative importance of this mechanism in the evolution of insular biotas. The same is true of the mention of dioecious modes of reproduction in insular floras. The statement (p. 54) that "wet forest is often more rich in species" must be approached cautiously with regard to the Hawaiian flora. Some may disagree when the author refers to low, sandy Pacific atolls as "little more than beaches." Too little is known about the effective dispersal and germination of wave-carried dissemules to assume that the lack of variability in strand species is a direct result of the constant reintroduction of new dissemules. Variation is recognized in such groups as Lepturus, Scaevola, Tribulus, Ipomoea, and Boerhavia.

Island Life includes a remarkable gamut of quality with regard to illustrative material which includes seven color plates, 103 separate photographs, and several hundred ink and brush illustrations. There are a host of maps to inform and orientate the reader to island groups. The illustrators, C. P. Papp and J. R. Janish, are represented by some excellent work. The drawings of insects and other animals by Papp are of a consistently high illustrative value. The exceptions are color plates I-IV which are juxtaposed to the magnificent plates reproduced from the works of Milne-Edwards and Grandidier. Papp's plates of the Hawaiian birds suffers most in comparison. The rendering of the plumage and the stance of each species seems artificial. Two jarring drawings, one of a booby (p. 25) and the other of a sickle billed vanda (p. 394) should have been omitted from the volume. Both are annoyingly askew as drawn by Papp. The usefulness of the illustrations could have been enhanced by the inclusion of a scale. The text deals with examples of gigantism, many of which are illustrated. But for those who ask "how large" or seek some comparison, the only recourse is the list of references by chapter at the back of the book. Often this reviewer found material mentioned in the text which was not covered in the reference lists.

This lack of refinement in the illustrations and references carries into the text. The use of Latin names is vigorously explained in the preface to the volume. In dealing with the highly specialized biota of islands, no apologia seems necessary. However, in this case, the author should have carefully checked the Latin names used. For example, a reference to the Indo-Pacific strand Scaevola as S. sericea is neither correct nor current usage. It occurred to this reviewer that volumes such as Island Life which are to reach a wide popular audience should be as carefully documented and corrected as scientific papers. This applies not only to nomenclatorial matters but also to a careful source check, in depth, in the literature. One reference (p. 269-270) to the hybridization of purple fruited Scaevolas in the Hawaiian Islands gives the impression that the discovery of this phenomena is a recent occurence. Such is not the case. The flora of the Tokelau Islands is small (p. 76), but size does not relate the flora to the Ellice Islands as claimed. Clearly this volume could have benefited from a much wider pre-publication reading. Many of the errors must fall to inadequate proofreading. I was surprised to read that the extinct bird, Psittacirosta cantans mentioned on page 125 had undergone a resurrection on page 127.

These cavils are minor, but this reviewer feels strongly that volumes of popular biology cannot afford slipshod manufacture. In spite of a number of annoying errors, Dr. Carlquist has provided an interesting modern work on the life found on islands. The range of the potential audience is from junior high students to academic specialists. The chapters evidence a high degree of organization and the oddments of plants and animals are constantly absorbing. Above all, the author has largely succeeded in a prose style which is direct, conveys enthusiasm, and, at the same time, introduces a judicious amount of technical terms. On this score alone, Island Life can be highly recommended.

But Island Life is especially recommended to those of us who live on islands. There is no carping in this volume about the destruction of many of the fragile organisms by man. The sense of wonder which one cannot escape while reading this chronicle of marvelous creatures can go far in educating islanders to certain responsibilities which even to this day,

are taken seriously by only a fraction of the insular population. It is this sense of wonder which I think Carlquist succeeds in inducing most effectively. With this in mind, it is possible to overlook the presentation of the lizard on p. 19 who is imputed to be "hopeful of arrival on an island"! (C. R. Long)

N E W S A N D N O T E S [1]

HAWAIIAN SUGAR PLANTERS' ASSOCIATION EXPERIMENT STATION: R. L. Cushing, Director of the Experiment Station, has appointed Dr. Louis G. Nickell as Assistant Director. Dr. Nickell will continue in his present capacity as Head of the Physiology and Biochemistry Department. He was head of the Phytochemistry laboratory of Charles Pfizer & Co. in New York prior to coming here in 1961. A native of Little Rock, Arkansas, he received his BS degree in 1943, his master's in 1947, and his doctorate in plant physiology in 1949, all from Yale University. He was with the Brooklyn Botanical Garden prior to joining Pfizer.

PINEAPPLE RESEARCH INSTITUTE OF HAWAII: Dr. Sterling Wortman left PRI directorship to become Director of Agricultural Sciences at the Rockefeller Foundation in New York. He will have world-wide responsibilities in the foundation program in agriculture.

The new Director of PRI, Dr. Wally Sanford, was formerly head of the Physiology and Soils Department. He has been a long-time active member of the Society and served as Managing Editor of the Newsletter from 1963 to 1964.

HAWAIIAN BOTANICAL GARDENS FOUNDATION, INC: The annual meeting was held on January 12. The speaker was Mr. Harry Camp, Assistant Director in Charge of Recreation Studies, Pacific Southwest Forest and Range Experiment Station, Forest Service, USDA, in Berkely, California. His topic was "Mountain Land Recreation."

The following were elected Trustees: Mrs. Anne Benner, Dr. George W. Gillett, Admiral (ret.) R. D. Higgins, Miss Beatrice Krauss, Dr. Charles H. Lamoureux, Mrs. A Lester Marks, Mr. J. Scott B. Pratt, and Mr. Marshall M. Ross. At the trustees' meeting which followed the general meeting, the following officers were reelected: President, W. W. Goodale Moir; First Vice-President, Mrs. A. Lester Marks; Second Vice-President, Richard A. Cooke, Jr.; Secretary, Dr. Constance E. Hartt; Treasurer, Miss Beatrice Krauss; and Editor, Dr. Shosuke Goto.

ORCHID SOCIETIES: The Pacific Orchid Society is hard at work on an ambitious "Spring Garden Show." It will cover, in addition to orchids, all other areas of horticulture. These include flower arrangements, flowering plant exhibits, nursery stock, art displays, and commercial exhibits. The theme of the show is 'Hawaiian Sunshine,' and it will be held at the Honolulu International Center on March 4-6 from 10:00 a.m. to 10:00 p.m. Show chairman is Theodore Green, Landscape Architect, Department of Parks & Recreation, City and County of Honolulu.

Many island orchid lovers are planning to attend the Fifth World Orchid Conference in Long Beach, California, from April 13-22. These conferences are held every three years. The Hawaiian Orchid Societies, Inc. has reserved 500 square feet of display space to put on an exhibit worthy of the islands. Speakers from Hawaii will be the Rev. Masao Yamada and Drs. Harry Kamemoto and Yoneo Sagawa of the University of Hawaii.

Orchid grower Oscar M. Kirsch recently received after a long delay, four beautiful Gold Medals and two Silver Medals for exhibits entered at the Vienna International Garden Show. Among these was the Gold Prize of Honor of the Mayor of Vienna, the top prize of the show.

---

[1] By Shinya Namiki, Assistant Editor, through the cooperation of the various News Representatives of the Newsletter.

A visitor at the last meeting of the Pacific Orchid Society was Dr. Yeoh Bok Choon, Editor of the Malayasian Orchid Bulletin, and past President of the Orchid Society of Malaysia. He is the Head of the Medical Services for the State of Johore, and private physician to the Sultan of Johore.

The monthly judging sessions of the local panel of the American Orchid Society will be held at the Foster Botanic Garden beginning in May 1966. They are presently held at Henke Hall at the University of Hawaii.

PLANT QUARANTINE DIVISION, ARS, USDA: In early February two new Plant Quarantine Inspectors will be added to the Honolulu staff. They are A. A. Perkins and R. T. Uyeda, who have completed their training at the Division Training Center, New York.

Pacific Regional Supervisor K. L. Maehler will be here on a supervisory visit from January 23 to February 5. He will visit the ports of Honolulu and Hilo.

New Year's Day was a busy one for the inspectors of this port. A total of 4,600 passengers, 42 aircraft, 13,800 pieces of baggage, 2,985 flowers, and 2,255 pieces of cargo destined for the Mainland, Canada, Australia, and New Zealand were cleared at Honolulu International Airport.

Two former Honolulu inspectors now on the Mainland have recently received promotions: Carl K. Sato is Assistant Inspector in Charge at El Paso, Texas, and Robert H. Nave became the Inspector in Charge at the new station at El Toro MCAS, California.

UNIVERSITY OF HAWAII:

Department of Plant Physiology: Dr. James A. Lockhart resigned to accept a position at the University of Massachusetts. His address will be: Department of Botany, University of Massachusetts, Amherst, Mass. 01003. His principal interest during his five years here was factors affecting plant stem growth. He had a dozen articles published on subjects ranging from the interaction of light, gibberellin, and chlorocholine in hypocotyl elongation, to a theoretical analysis of plant cell growth in relation to extensibility and turgor pressure. His successor, expected in June, will be Dr. Bruce J. Rogers, a specialist on herbicides and the biochemistry of herbicide action. Dr. Rogers is from Purdue University and the East Hawaii Branch of the Experiment Station.

Horticultural Notes (Extension Service): Certain varieties of cauliflower, bean, pea, sweet corn, lettuce, and tomato seeds are available from the University of Hawaii. Address inquiries and requests to the Seed Distribution Laboratory, Department of Horticulture, 1820 Edmondson Road, University of Hawaii, Honolulu 96822.

Testing and introduction of tropical fruits is a big project at the University of Hawaii Experiment Station. Fruits are tested state-wide, since their performance differs from one location to the next. Some of these are: cherimoya, avocado, banana, orange, papaya, kawa, cola nut, okari nut, cashew, sapodilla, and governor's plum.

To harvest avocados all year round, one might plant three varieties that ripen in different seasons. Varieties suitable for summer and winter are Itzamna, Yamagata, and Obata; for fall and winter, Kahaluu, Beardslee, and Fuerte; and for winter and spring, Fujikawa and Haas.

A new, uniformly small-fruited papaya (Line 10 Solo) suitable for export purposes is being released to growers in the Puna area for comparison with larger-fruited export strains now being marketed.

Department of Horticulture: Visitors to the Department were Dr. H. J. Reitz, Horticulturist in Charge, University of Florida Citrus Experiment Station, Lake Alfred; Dr. Robert E. Lee, Professor of Floriculture, Cornell University; Dr. Dorothy Niimoto, Cytologist, U. S. National Arboretum, Washington, D. C.; and Dr. Richard A. Bradfield, Rice Institute.

Dr. James L. Brewbaker attended a meeting of the National Science Foundation Summer Science Program in New Orleans in January. Dr. Robert Warner and Dr. Richard A. Hamilton attended the International Citrus meetings in Japan in November. Dr. Warner will discuss certain aspects of this at the February meeting.

Dr. Donald P. Watson, Professor and Extension Specialist, recently returned from a study of methods of culture, packaging, and marketing of flower crops, and landscape methods of Encinitas, San Diego, and Orange counties in California. Late in March he will conduct a garden tour of Washington, British Columbia, Japan, Taiwan, Hong Kong, Bankok, and Hawaii, for the purpose of obtaining the latest landscape and horticultural practices for a proposed curriculum in landscaping at the University.

Department of Botany: During the Christmas recess Dr. George W. Gillett visited the herbaria at the Smithsonian Institution and Harvard University in conjunction with his research work. Dr. A. C. Smith attended the AAAS meetings in Berkeley during this period.

Dr. Noel P. Kefford arrived in December to assume the position of Chairman of the Department and Professor. He comes to Hawaii from Canberra, Australia, where he was Principal Plant Physiologist at the CSIRO. His mother, wife, and three children arrived on January 20. He succeeds the interim chairman, Dr. Gladys E. Baker.

Dr. Melvin L. Bristol arrived on that same day. He will be an Assistant Professor during the spring semester, and will teach the "Plant Kingdom," and "Origin and Evolution of Cultivated Plants." Dr. Bristol recently received his PhD from Harvard University after completing an ethnobotanical study in South America. His family will arrive at a later date.

Dr. Clifford Smith will arrive shortly before the beginning of the Spring Semester as Visiting Assistant Professor. He comes from the University of Manchester in England, and will teach plant anatomy and microtechnique.

NEW MEMBER: Norman K. Carlson of Kealakekua, Hawaii, was elected a member of the Society at the January meeting.

ADDRESS CHANGES: Dr. Anthony Hepton, 1076 Lunahooia Place, Kailua 96734, and Mr. Colin Potter, Box 124, Volcano 96785.

POBSP: The Pacific Ocean Biological Survey Program, United States National Museum, has completed field botanical investigations of the Hawaiian Leeward, Line, Phoenix, northern Gilbert, eastern Marshall, Tongareva, Caroline, Vostok, and Tokelau Islands. Other collections have been made on all of the Oahu off-shore islands and Tutuila. Approximately 6,048 specimens of vascular plants, lichens, mosses, and algae have been collected. Soils have been sampled. To date, eleven specialists have aided in the sorting and identifications. In cooperation with the Department of Botany, University of Hawaii, space has been provided for the temporary housing of these collections. We can expect numerous publications in the next few years based on this valuable material.

ELEVENTH PACIFIC SCIENCE CONGRESS: The Hawaiian Academy of Science is sponsoring charter flights to Tokyo, Japan, for the Eleventh Pacific Science Congress. They will depart on August 18, return to Honolulu on September 13. The round trip cost is estimated to be $270. Individuals who are members of the Academy for at least six months prior to the trip are eligible. Membership applications may be sent to John Marr, USEWS, 2570 Dole Street, Honolulu 96822. New members will be mailed trip reservation applications upon approval of their membership applications. A $50.00 deposit (per person) must be submitted with the reservation application, which is non-refundable, but transferable. Spouse, children, and parents living with the member are also eligible for the reduced trip fare. Each jet flight will carry 144 passengers. Two charter flights are contemplated at the present time.

The Congress will be held at the University of Tokyo from August 22 to September 10, under the auspices of the Science Council of Japan. In the Information Bulletin of Pacific Systematic Botany, No. 1, a number of symposia will be held during the first week of the Congress which will be of interest to systematic botanists. These include: algae in the Pacific (biology and cultivation); biotic communities of the volcanic area of the Pacific

evolution, distribution, and migration of plants and animals in the Pacific area; medicinal and poisonous plants in the Pacific; Pacific palynology; and plant diseases in the Pacific.

During the second week, the division meeting on botany will be held. Two afternoons during this period will be devoted to the International Symposium on Plant Biosystematics. Symposium topics include: biosystematics of taxa whose ranges include large distribution; problems of chromosomal, polyploid, and ecotypic differentiation; biosystematics of Compositae; and biosystematics of weeds. Six Congress tours are planned during the third week to local cultural centers and places of scientific interest. A number of tours to scientific institutions will be held in the afternoons of both the first and second week. (akc)

BEAUMONT: A NEW DUAL PURPOSE MACADAMIA VARIETY: An article with that title in the California Macadamia Society Yearbook, 1965 by W. B. Storey (formerly with the HAES, UH), announces the name of a Macadamia variety which was introduced to Hawaii by Dr. and Mrs. J. H. Beaumont from Australia in 1954.

The new variety was named by the California Macadamia Society in honor of the Beaumonts, to commemorate their sojourn to Australia for eight months in 1953-1954. The new name is dedicated to the late Dr. J. H. Beaumont for his macadamia research work and his introduction of new varieties of that plant, and to his wife, Thelma Beaumont (a past Society Director) for her significant part as his constant companion, encouraging and helping him in his research. During this period in Australia, Dr. Beaumont was the recipient of a Fulbright Research Grant which was devoted to the study of Macadamia in the region to which it is indigenous.

In conjunction with his duties at the Hawaii Agricultural Experiment Station, Dr. Beaumont was responsible for enlarging the interest and research in Macadamia as a Hawaiian crop. His visit to Australia resulted in the shipment of 58 selections of propagative material, of which 49 were propagated successfully and established in Hawaii. The Beaumont variety is importation NSW-44, which was entered as Macadamia accession HAES No. 695.

The Department of Horticultural Science, University of California, Riverside, obtained scions of this accession in 1959. It was distributed in southern California and attracted much attention because it is not only desirable as a nut-bearing tree, but also as an ornamental tree. Its productivity, coupled with beauty of foliage and vigor of growth make it stand out among other varieties and clones, and this led to the decision that it deserved perpetuation as a named variety. It is a natural hybrid of M. tetraphylla and M. integrifolia. The young leaves have reddish-bronze blades with bright red midribs and veins. The upper surface of mature leaves is a dull dark green, and the lower surface a lighter green. The flowers are numerous (300-500) and bright pink. The nuts are medium to large in size (7/8 to 1-1/8 inches in diameter), with a thin side shell (1/32-1/16 inch). The flavor and texture of the nut is very good, and 85% are grade A, and 15% grade B. In California, the season for fruiting is January to March. (akc)

H A W A I I A N B O T A N I C A L S O C I E T Y M E E T I N G

Date : February 7, 1966

Time : 7:30 p.m.

Place : HSPA Experiment Station, Agee Hall
1527 Keeaumoku Street

Speaker: Dr. Robert M. Warner, Professor of Horticulture
University of Hawaii

Subject: Citrus Ecology in Japan

In November 1965 Dr. Warner participated in the two weeks' International Citriculture Meeting and Interchange, sponsored by the East-West Center in Japan. In addition to the presentation of reports, field trips and discussion sessions were held in the three principal Citrus producing Prefectures: Shizuoka, Wakayama and Ehime. Dr. Warner later visited the University of Kyoto and Horticultural Research Station, Ministry of Agriculture, at Hiratsuka, Kanagawa Prefecture.

Dr. Warner reports that Japan's rapidly growing citrus acreage exceeds that of California. His illustrated report will cover this intensive Citrus culture at the northern edge of the world citrus belt. (geb)

E D I T O R ' S N O T E S

YOUR EDITORIAL STAFF & FUTURE NEWSLETTER PLANS: After an absence of two years, the founder of the Newsletter is returning as Editor to report on the "botanical news and progress in Hawaii and the Pacific." He is no stranger to the Society, having already served in a multitude of offices in this "august body." He has, however, plans to retire from all Society responsibilities in the fall. At that time Dr. Charles H. Lamoureux, Associate Professor of Botany, University of Hawaii, returns from his sabbatical leave at the Department of Botany, Canterbury University, Christchurch, New Zealand. Charlie, who has served as a Society officer (Secretary, President, and Director), has graciously consented to serve as Editor of the Newsletter upon his return to Honolulu. Since some confusion may exist as to the present Editor's employment, duties, and titles, these are being restated: Full-time, he is employed as a Plant Quarantine Inspector by the Plant Quarantine Division, Agricultural Research Service, US Department of Agriculture; and part-time, Lecturer in Botany at the University of Hawaii, and Assistant Botanist, Bernice P. Bishop Museum.

Your new Associate Editor is C. R. Long. Bob hails from Long Beach, California (originally). He received his B.A. in Botany from the University of Toronto in 1959 and his M.A. in Botany from the University of Massachusetts in 1961. He remained at Massachusetts an additional year as NDEA Fellow. He was Instructor in Biology at Windham College in Putney, Vermont from 1962 to 1964. During the summer of 1963 he was an NSF Fellow at the NSF Summer Institute in Desert Biology at Arizona State University. He arrived in Honolulu in April 1964 as Research Curator in Botany for the Pacific Ocean Biological Survey Program, Smithsonian Institution. During the past two years he has explored many of the Central Pacific Islands. He is currently curating and studying the plant specimens collected. This position will terminate in June 1966. His wife, Marie, also has a Master's in Botany, and teaches science and mathematics at Punahou School.

Bob will be responsible for the feature portions of this Newsletter, and also any other details which the Editor does not desire to do. Contributions to the feature section are welcomed and invited. We particularly invite Society meeting speakers to submit abstracts of their talks as our past president has so graciously done (see pages 1-3 of this issue). We will continue the series of "Profiles of Hawaiian Botanists" from time to time as they are received.

Your new Assistant Editor is Shinya Namiki of Honolulu (now Pearl City). He received his B.S. in Vocational Agriculture in 1940 and his Fifth Year Certificate in 1941, both from the University of Hawaii. After a brief period of teaching at Lahainaluna High School, he was called to service with the US Army. His tours of duty included Africa, Italy and France. After his discharge in 1945, he joined the Territorial Plant Quarantine Branch as an inspector. He became a federal Plant Quarantine Inspector in 1956, and was promoted to Supervisory Plant Quarantine Inspector in 1961. Of late, his son Michael has been in the news as an Iolani School debator and outstanding scholar.

Shinya will be responsible for editing the news which the News Representatives (their names are shown on the last page) submit to him. The deadlines for submission of news articles are: March 12, May 12, September 12, and November 12, 1966. News items should be sent to Mr. Namiki at the following address: Plant Quarantine Division, ARS, USDA, P. O. Box 9067, Honolulu 96820. We would like to thank our News Representatives for their willingness to serve and for their contributions to this issue. Individuals or institutions not represented by the appointed News Representatives are invited to send news items directly to Mr. Namiki. His work in compiling the news items is greatly appreciated, and the extensive section in this issue indicates the time and effort spent.

We would like to emphasize to Society members that this is your Newsletter, and its quantity and quality, while somewhat controlled by the editorial staff, is largely dependent upon your cooperation and news and feature contributions. Only through your assistance in this project can we truly report on botanical events in Hawaii and the Pacific. (akc)

D U E S

Members are reminded that the 1966 dues were payable as of the January meeting. It would be greatly appreciated if you would forward them as soon as possible to the Treasurer (Mr. W. M. Bush, Castle & Cooke, Inc., P. O. Box 2990, Honolulu 96802). Prompt payment of dues (regular members, $3.00; student members, $2.00) will save the Society both time and funds. Those who are delinquent (1965 dues) are reminded that their names will be dropped from the membership rolls if payment is not received by January 31, 1966.

H A W A I I A N B O T A N I C A L S O C I E T Y
c/o Department of Botany, University of Hawaii
2550 Campus Road, Honolulu, Hawaii 96822

OFFICERS

PRESIDENT.....Dieter Mueller-Dombois
(Dept. Botany, Univ. Hawaii)
VICE-PRESIDENT.....Gladys E. Baker
(Dept. Botany, Univ. Hawaii)
SECRETARY.....Richard W. Hartmann
(Dept. Horticulture, Univ. Hawaii)
TREASURER.....William M. Bush
(Castle & Cooke, Inc. Box 2990, 96802)
DIRECTORS.....James L. Brewbaker
(Dept. Horticulture, Univ. Hawaii)
.....John Warner
(Dept. Genetics, HSPA Expt. Sta.)

THE HAWAIIAN BOTANICAL SOCIETY was founded in 1924 to "advance the science of Botany in all its applications, encourage research in Botany in all its phases," and "promote the welfare of its members and to develop the spirit of good fellowship and cooperation among them. Any person interested in the plant life of the Hawaiian Islands is eligible for membership in this Society."

EDITORIAL STAFF

EDITOR.....Alvin K. Chock
(PQD-ARS-USDA; UH Botany; Bishop Museum)
ASSOCIATE EDITOR.....C. R. Long
(POBSP, Smithsonian Inst., c/o UH Botany)
ASSISTANT EDITOR.(NEWS)....Shinya Namiki
(Plant Quarantine Division-ARS-USDA)
PRODUCTION MANAGER..Mrs. Edith Hazelwood
(HSPA Expt. Sta.)
NEWS REPRESENTATIVES:
Bishop Museum.....Harold St. John
Haw'n. Bot. Gard. Found..Constance Hartt
HSPA Expt. Sta.....Louis G. Nickell
Honolulu Botanic Gard.....Paul Weissich
Orchid Growers & Societies..Oscar Kirsch
Plant Quar. Div. ARS-USDA.Edward Tsugita
Pineapple Res. Inst.....Jimmie Bob Smith
University of Hawaii.....Noel P. Kefford
(Botany); Shosuke Goto (Col. Trop. Agr.);
Robert M. Warner & Donald P. Watson
(Horticulture); Minoru Aragaki (Plant
Pathology); Edison Putman (Plant
Physiology); George W. Gillett (H. L.
Lyon Arboretum).

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01771 7364

HAWAIIAN BOTANICAL SOCIETY
c/o Department of Botany
University of Hawaii
2550 Campus Road
Honolulu, Hawaii 96822

BLK. RT.
AD'L. 3/8¢ FD.

HONOLULU HAWAII
U.S. POSTAGE
02
03 METER
P.O. 370793

--

Return Requested

Please Post

LIBRARY
U.S. NATIONAL MUSEUM
WASHINGTON 25, D. C.